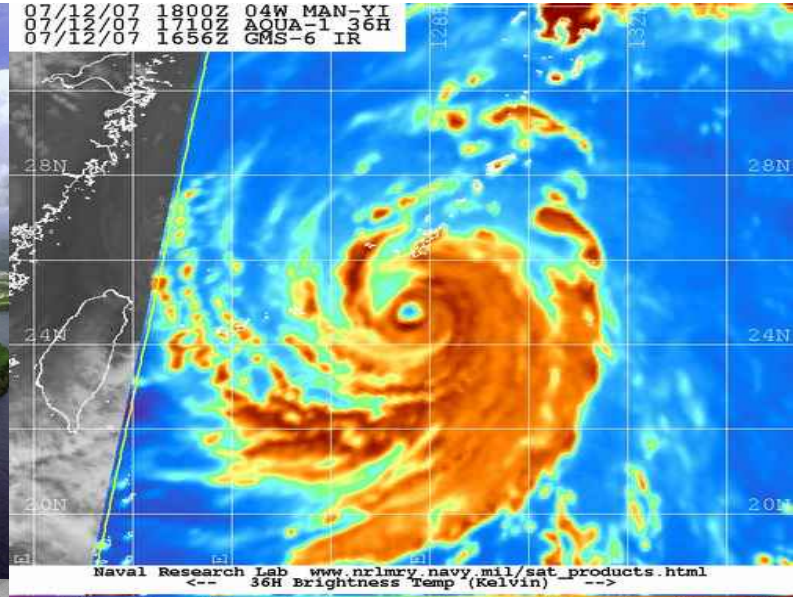
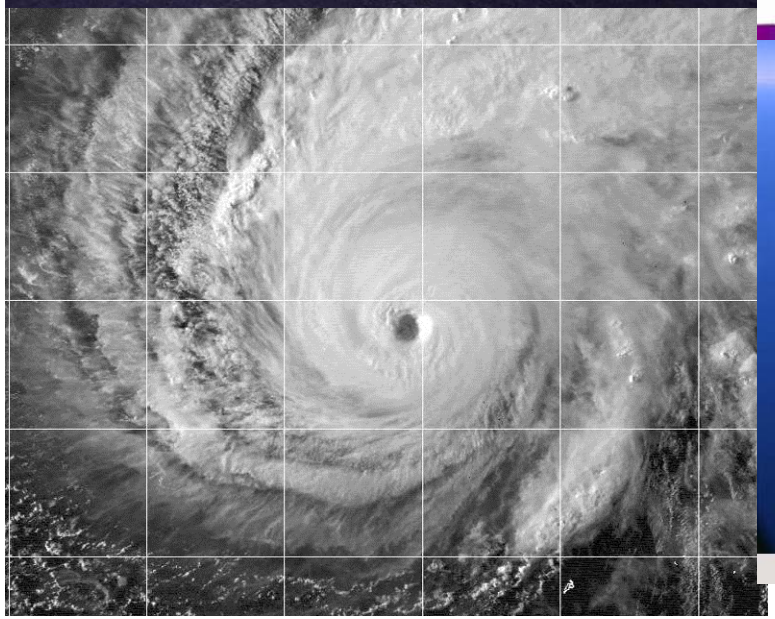
Global Hawk TC Recon in the Western North Pacific

An Operational Needs Analysis

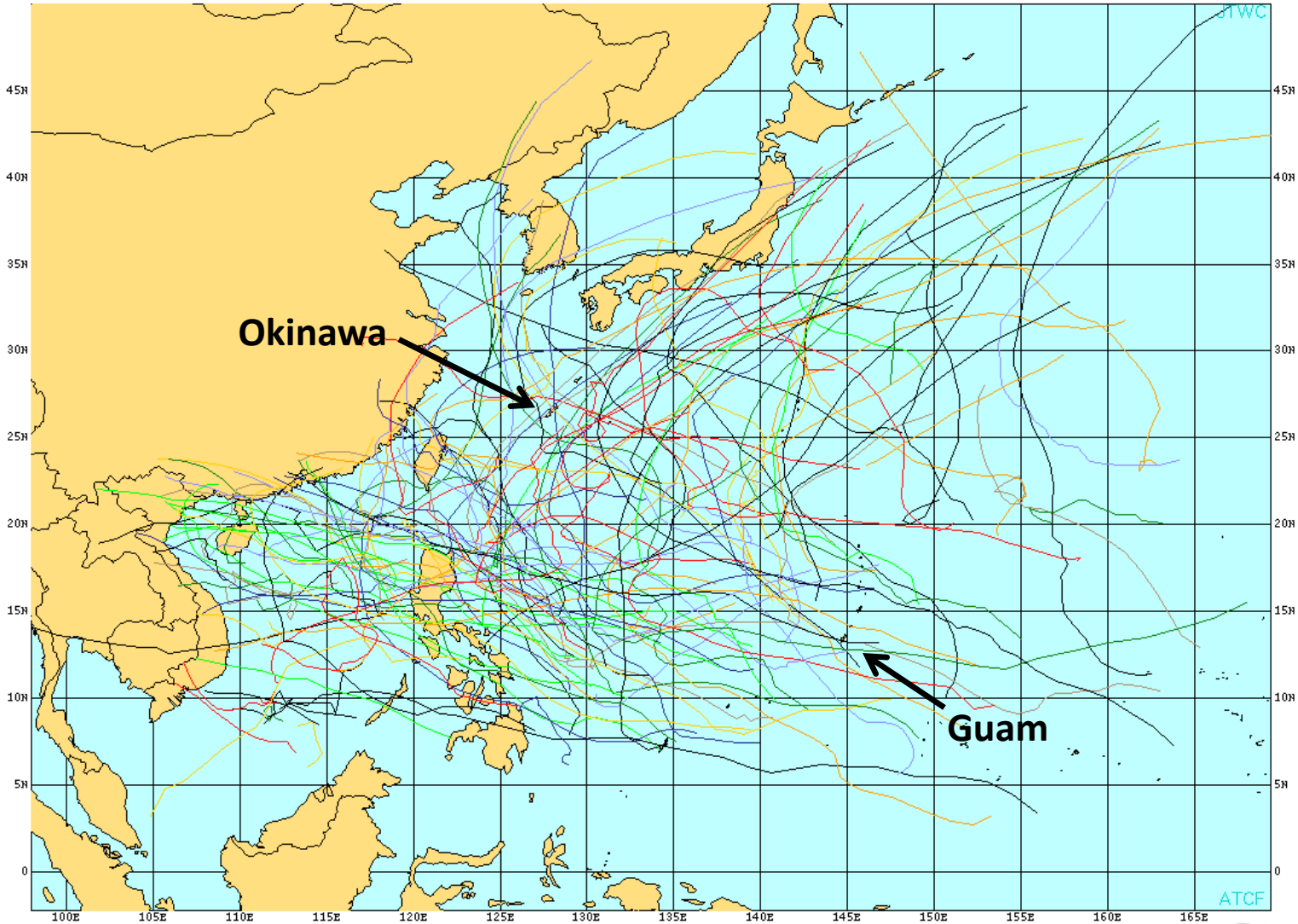




Overview

- Operations Background
- Tropical Cyclone Reconnaissance at JTWC – Importance of microwave data
- Storm Structure – Importance/Coverage of OSVW
- Sea Maneuver
- Combatant Commander Accuracy Requirement
    - National Security Strategy (NSS): Pivot to the Pacific
- Potential Sensing Strategy to Fill GAP to Supports NSS

WestPAC Last 5 Years

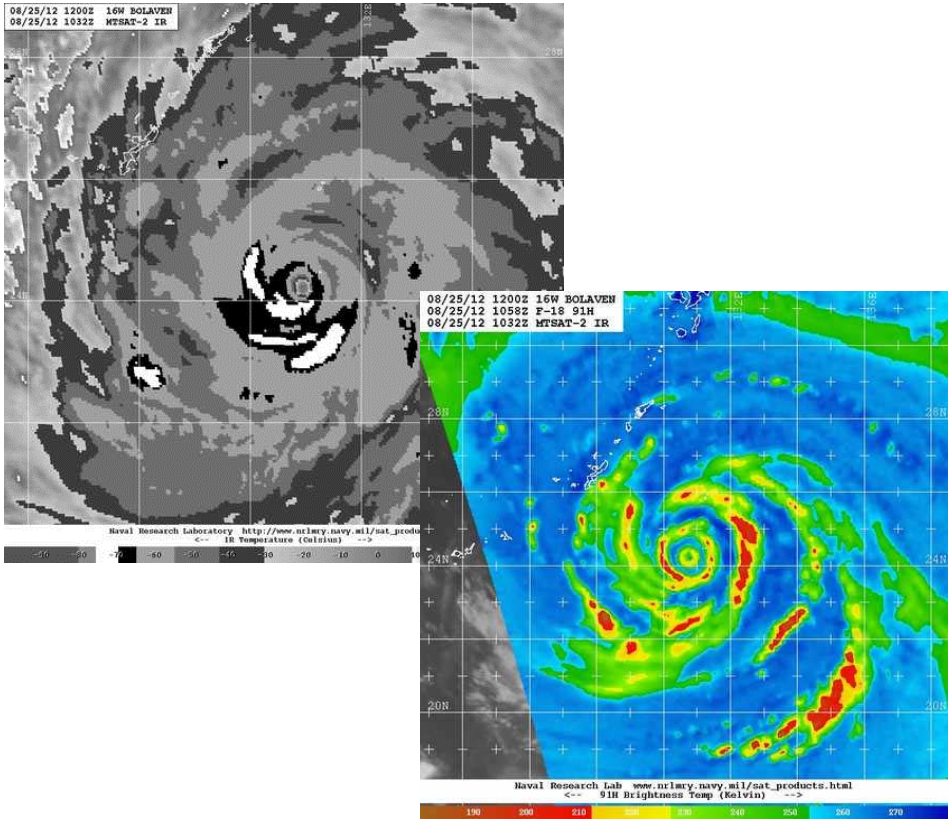


16.1N-151.6E

Satellite Reconnaissance

Position/Intensity Fixes

- Exclusively remotely sensed data – satellite/radar
- Infrared/Visible Imagery Fixes every 3 hours
- ALL Microwave Images as imagery is available

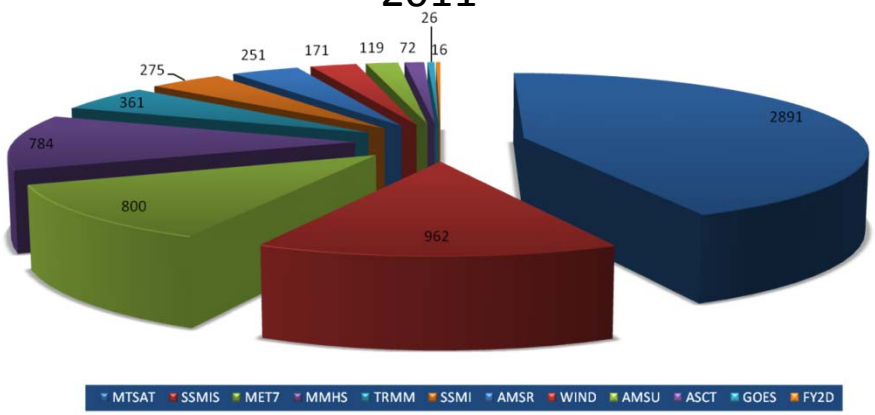


Satellite Fixes by Type

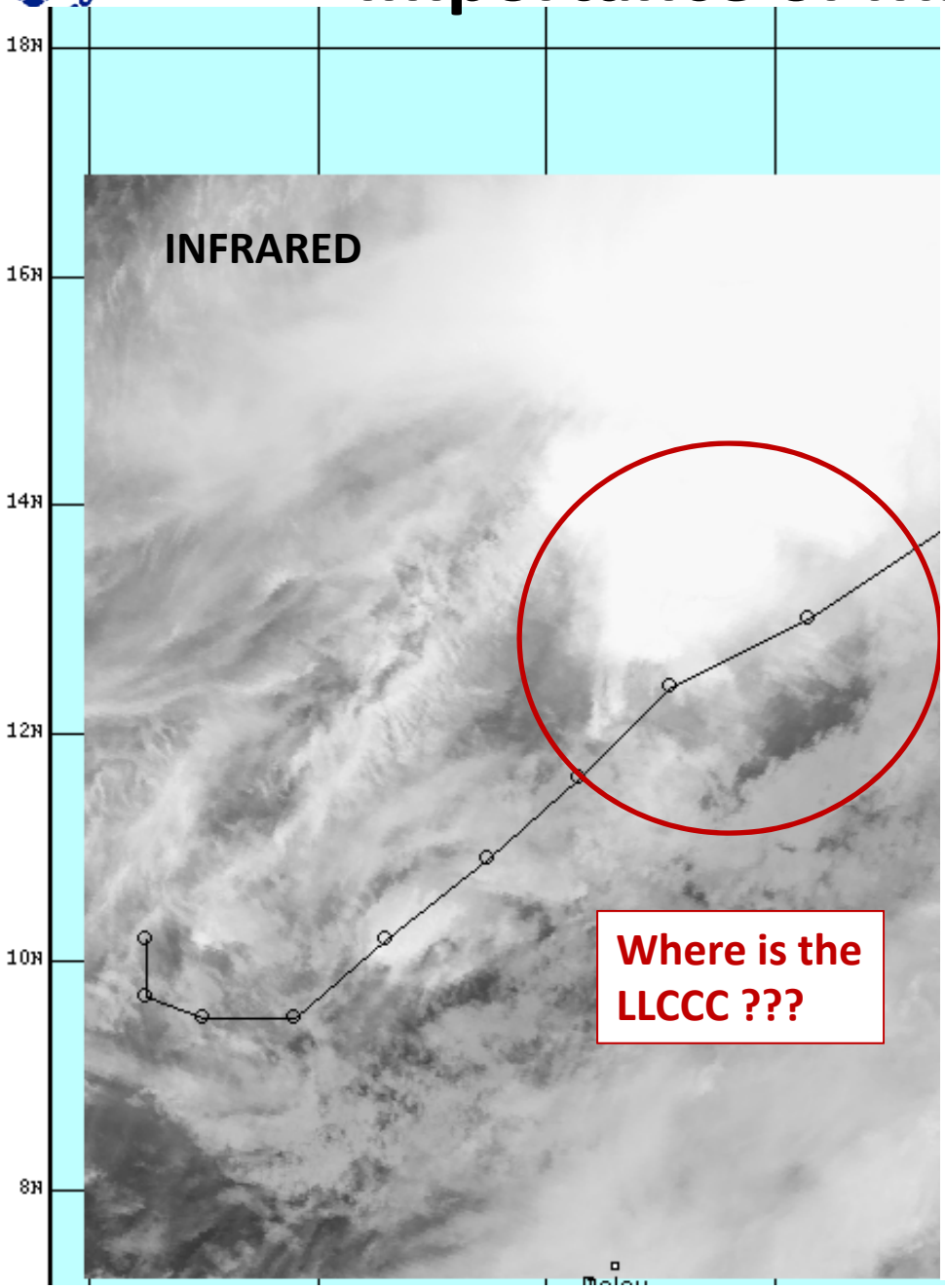
YEAR	TOTAL	VIS/EIR	MWI	%MWI
2,012	6,577	3,111	3,466	52.7
2,011	6,714	3,791	2,923	43.5
2,010	6,334	3,198	3,136	49.5
2,009	10,095	5,238	4,857	48.1
2,008	9,199	4,560	4,639	50.4
2,007	8,615	4,180	4,435	51.5

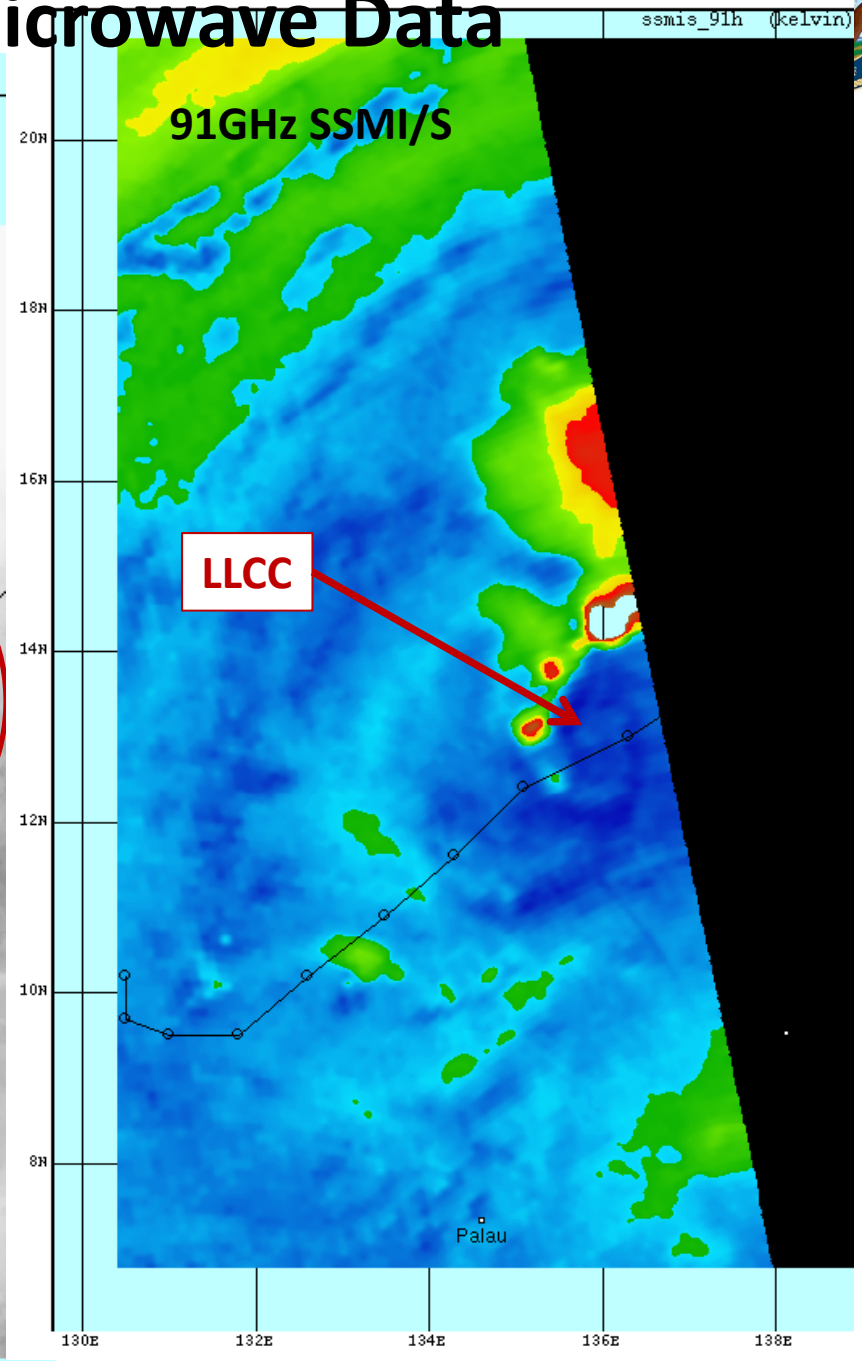
44-53%

2011

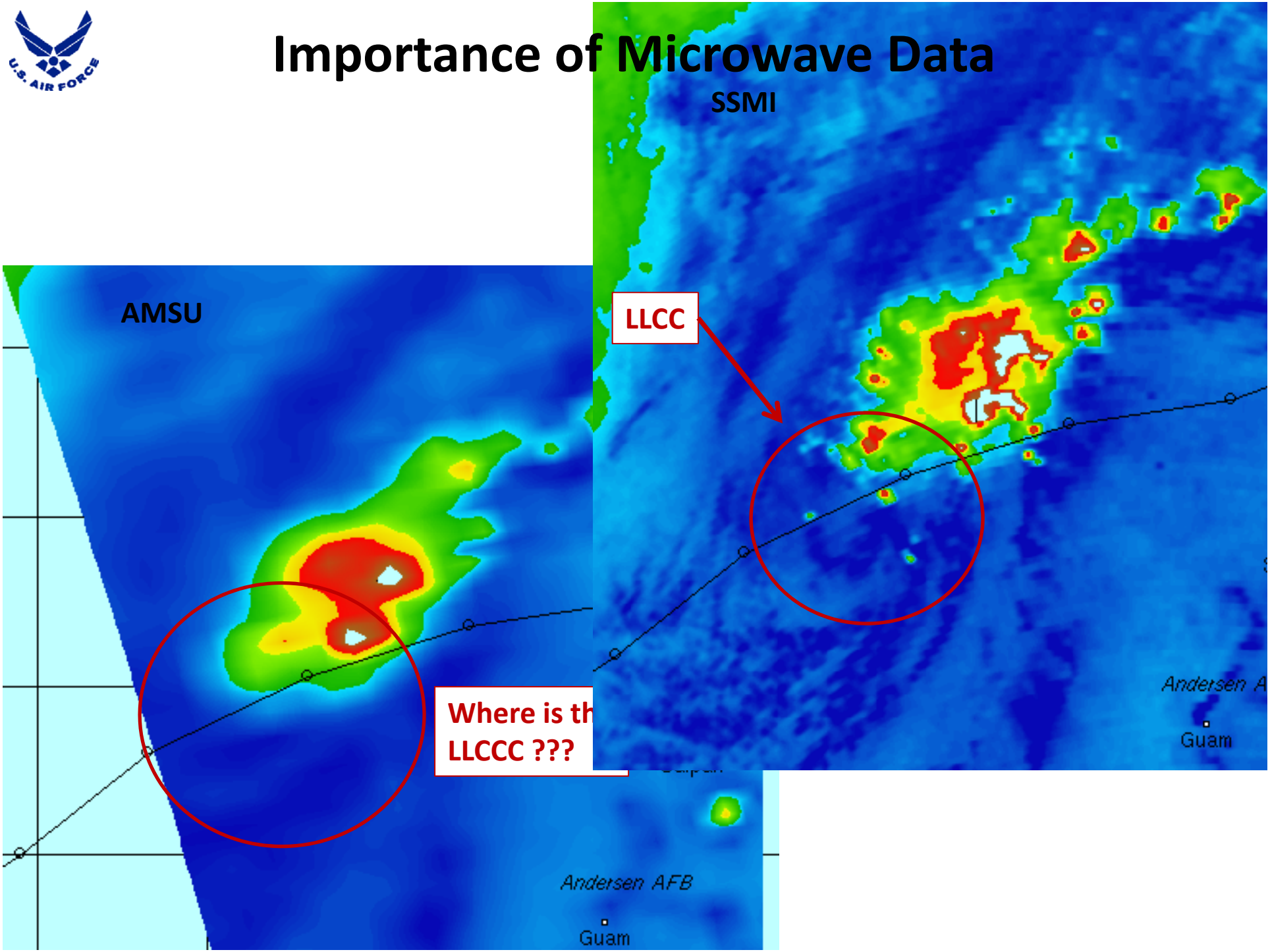


Importance of Microwave Data





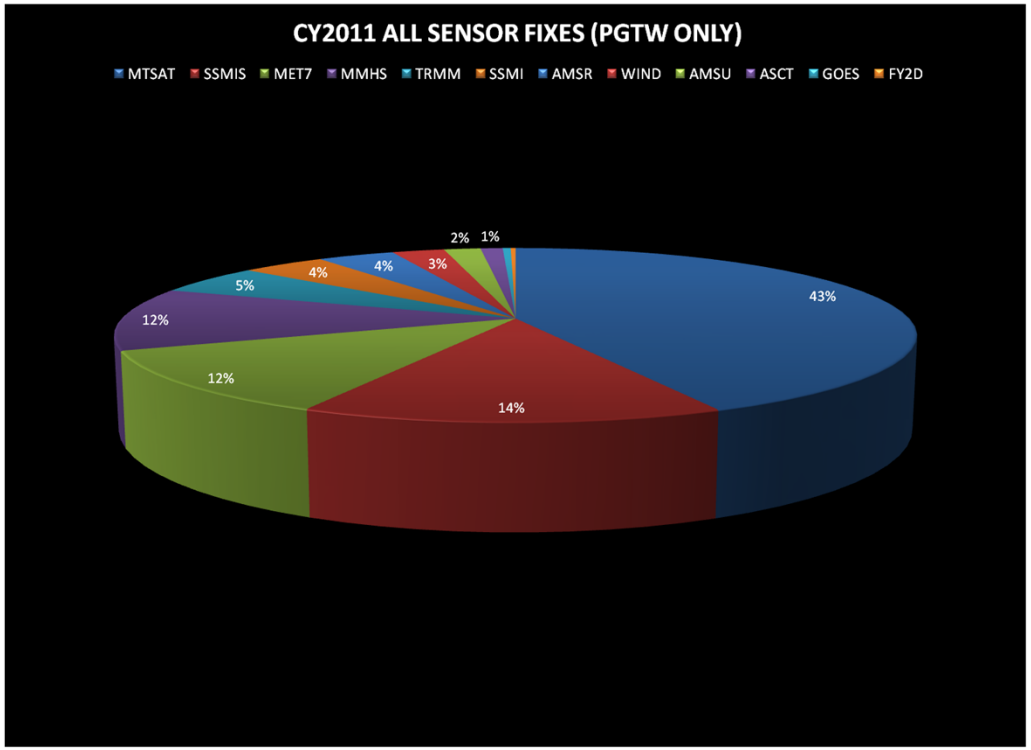
Importance of Microwave Data



Satellites Used at JTWC
Future (2016?)

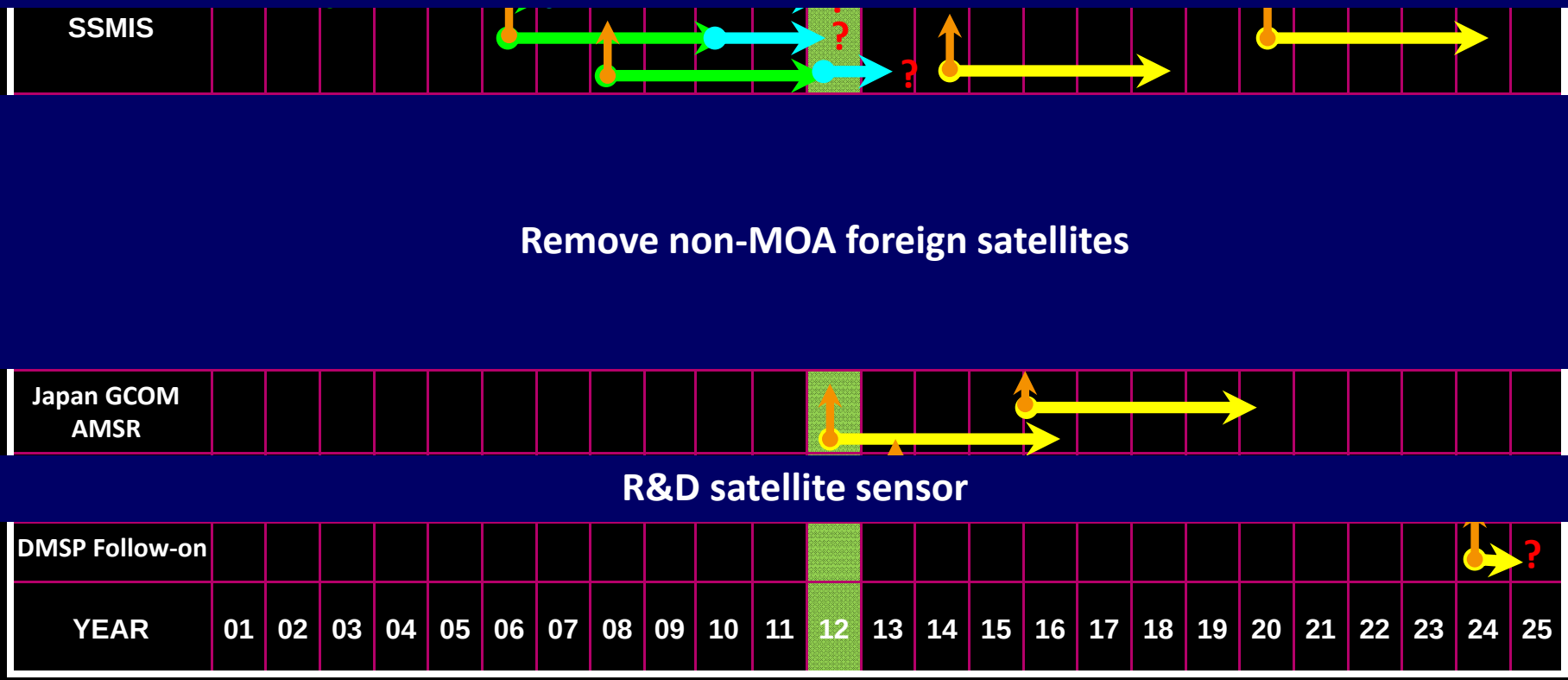
DoD: USAF – ~~F13~~, ~~F14~~, ~~F15~~, ~~F16~~, ~~F17~~, ~~F18~~, F19, F20
USN – ~~CORIOLIS/WINDSAT~~
DoC: NOAA – ~~N15~~, ~~N16~~, ~~N18~~, ~~N19~~, GOES-W, NPP, JPSS
NASA: ~~AQUA~~, ~~TERRA~~, ~~TRMM~~
Foreign: EUMETSAT – MET-7, METOP
INDIA – OCEANSAT-evaluation
JAPAN – MTSAT, GCOM
CHINA – FEN-YUNG
SOUTH KOREA – COMS

Data Types Used:
Visible, Infrared, Water Vapor, Multispectral, Mircrowave



Projected Availability of HiRes Microwave Data

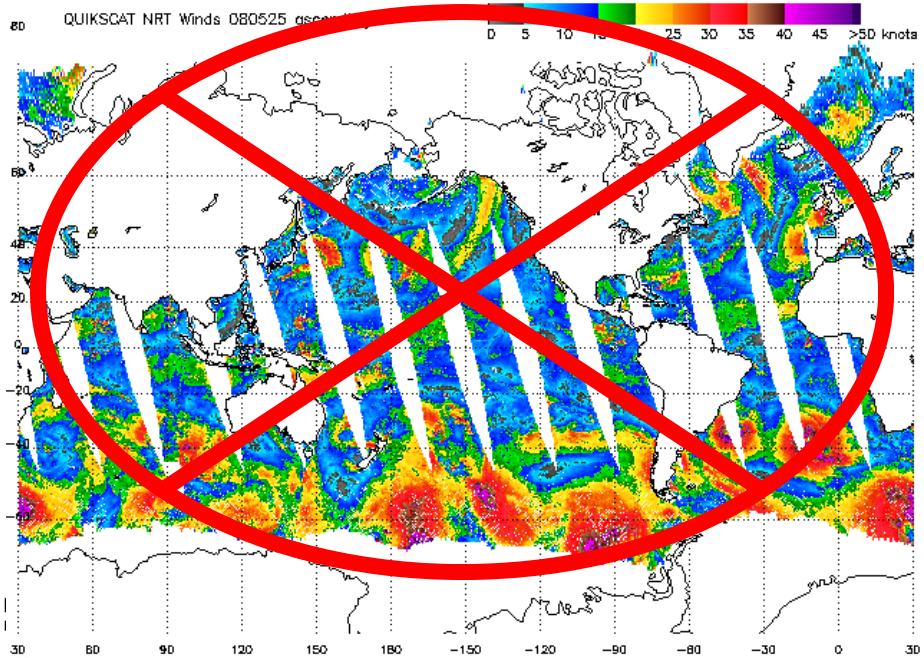
What's left in a few years after SSM/I, SSMI/S and old R&D satellites fail



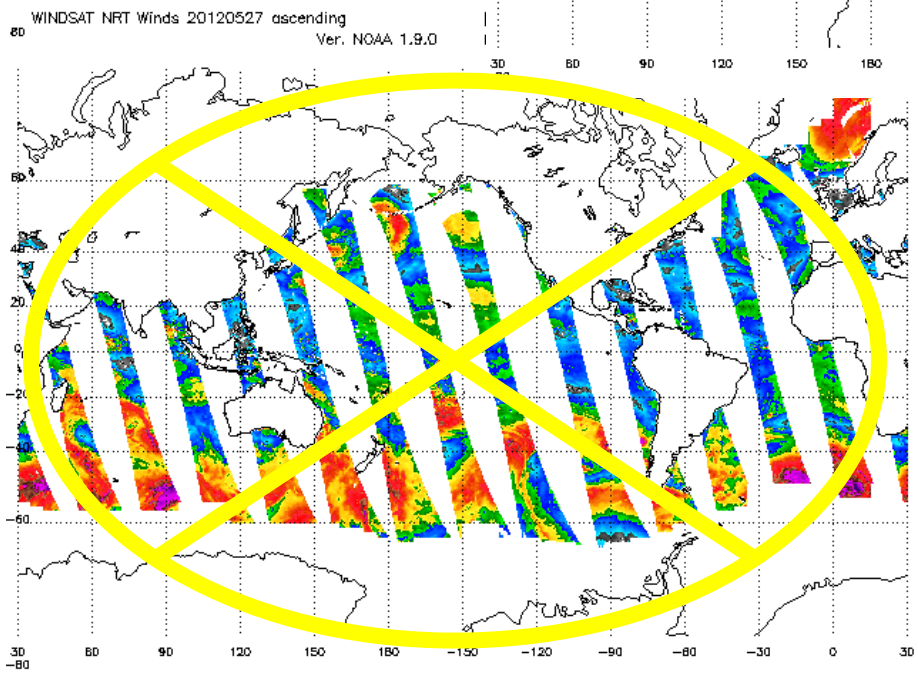
Launches | Primary mission | Extended mission | Future | No Data Access

OSVW Coverage for Location & Structure

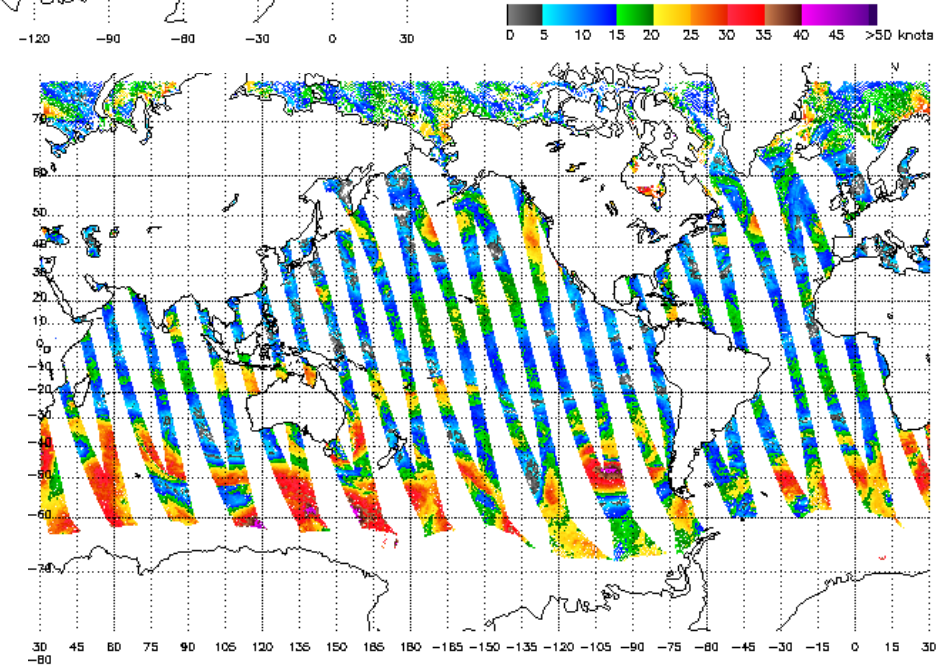
QuikSCAT-NASA



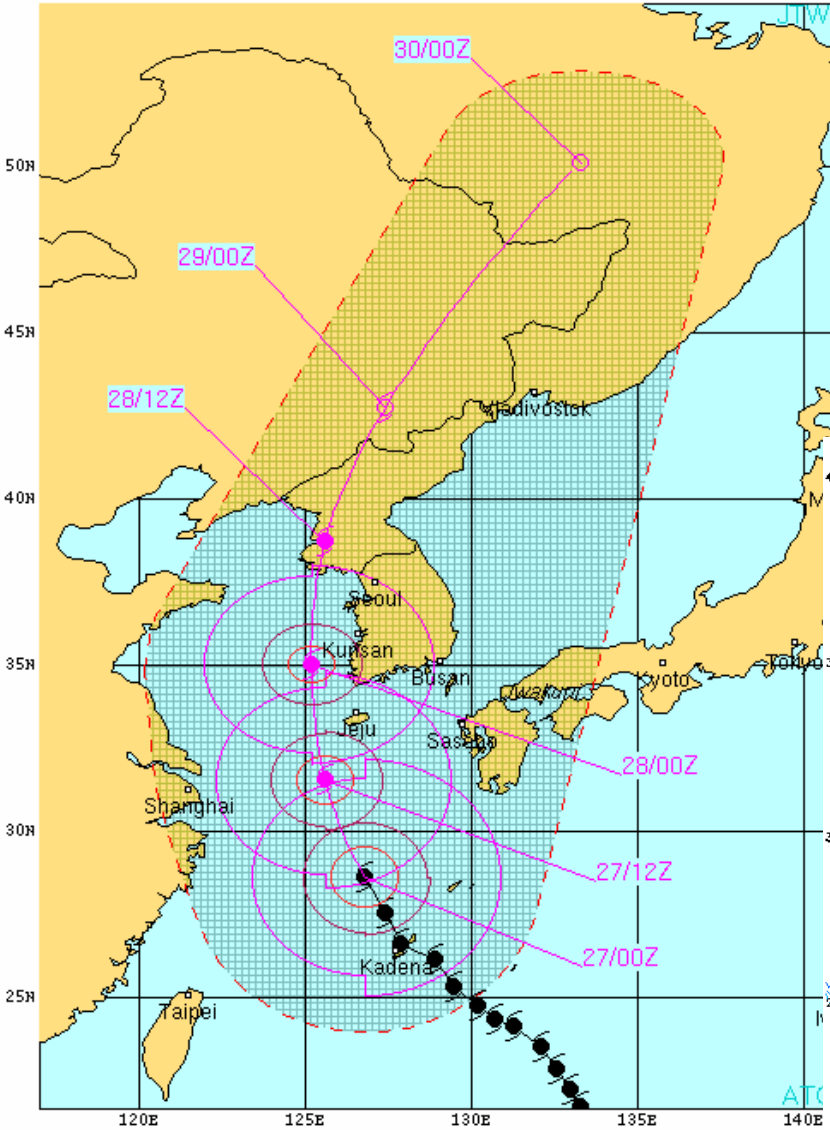
WindSAT - Navy



ASCAT - EUMETSAT

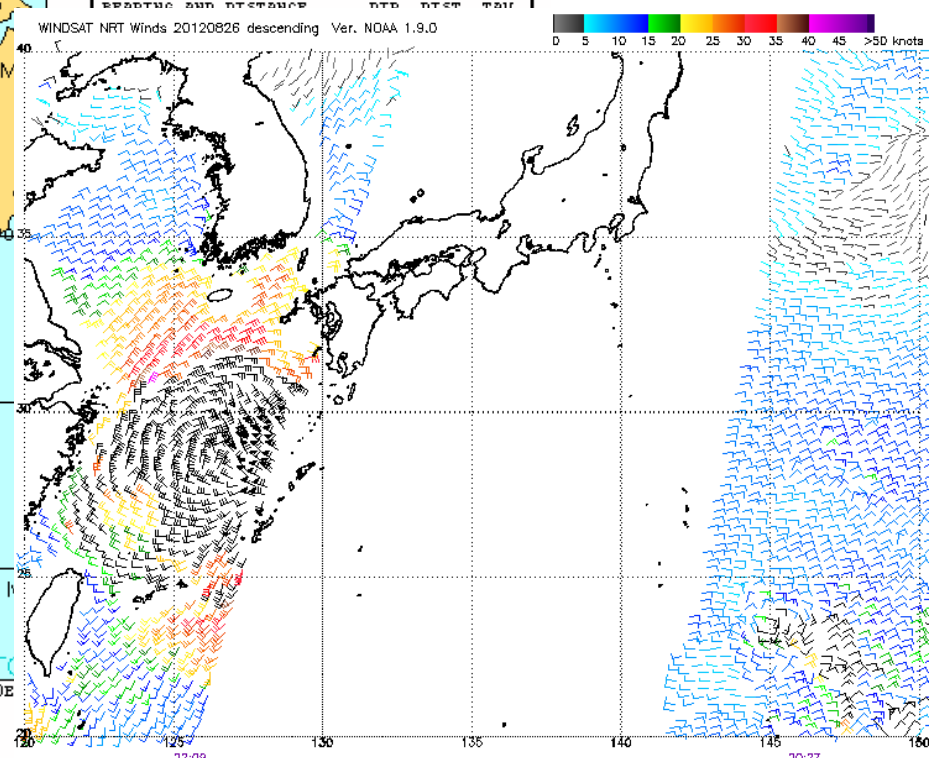


OSVW Coverage for Location & Structure




```
TYPHOON 16W (BOLAVEN) WARNING #29
WTPN32 PGTW 270300
270000Z POSIT: NEAR 28.6N 126.8E
MOVING 335 DEGREES TRUE AT 12 KNOTS
MAXIMUM SIGNIFICANT WAVE HEIGHT: 46 FEET
27/00Z, WINDS 095 KTS, GUSTS TO 115 KTS
27/12Z, WINDS 090 KTS, GUSTS TO 110 KTS
28/00Z, WINDS 080 KTS, GUSTS TO 100 KTS
28/12Z, WINDS 065 KTS, GUSTS TO 080 KTS
29/00Z, WINDS 045 KTS, GUSTS TO 055 KTS
30/00Z, WINDS 030 KTS, GUSTS TO 040 KTS

CPA TO:                NM     DTG
SASEBO                 219   27/17Z
IWAKUNI                340   27/21Z
CHINHAE                167   28/00Z
PUSAN                  191   28/00Z
KUNSAN_AB               67   28/03Z
OSAN_AB                 81   28/07Z
INCHON                  59   28/09Z
YONGSAN_AIN             77   28/09Z
```



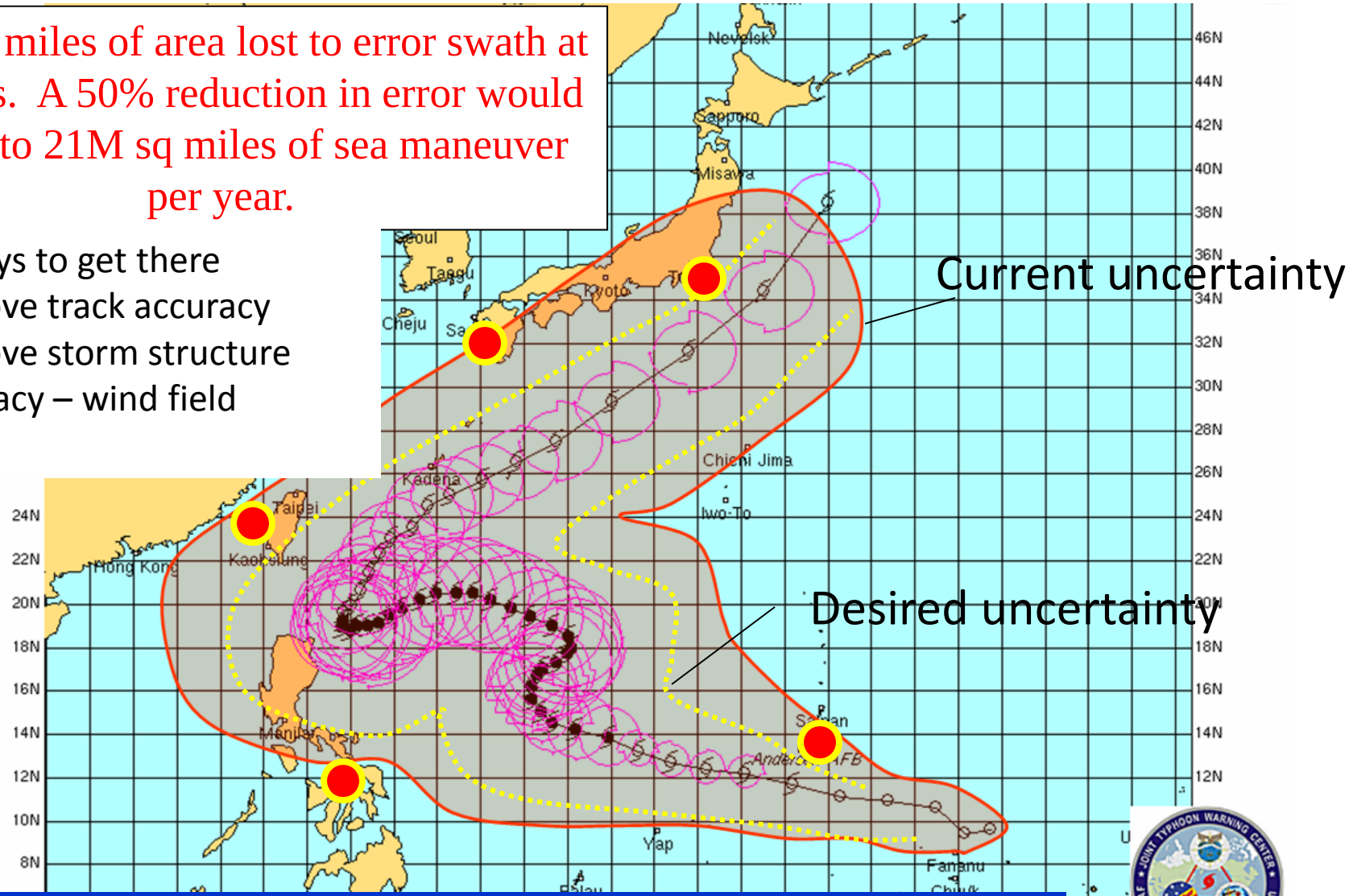
OSVW critical to wind field analyses and forecasts, which directly impacts operational readiness and resource protection measures

Western Pacific: Active Battlespace

1.4M sq miles of area lost to error swath at 72 hours. A 50% reduction in error would add up to 21M sq miles of sea maneuver per year.

Three ways to get there

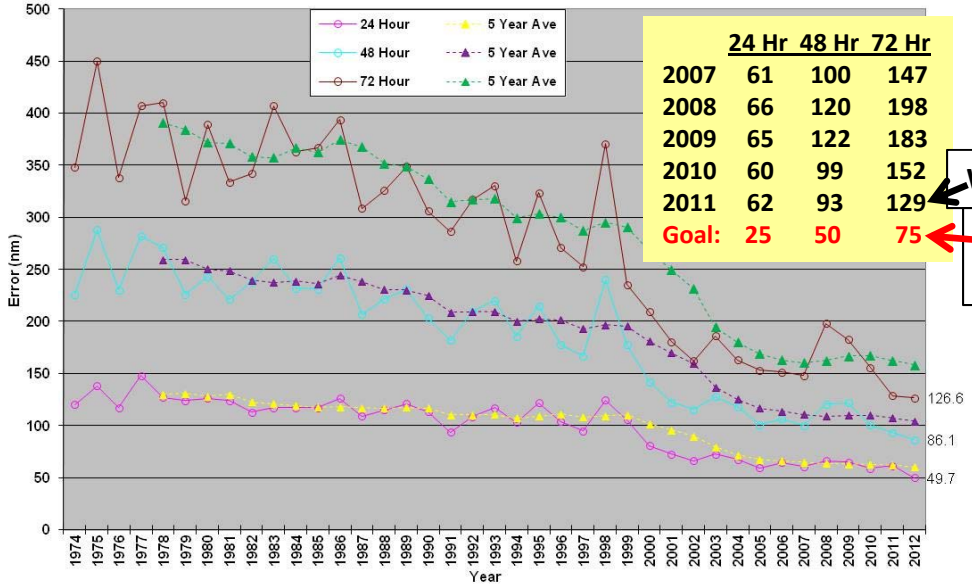
1. Improve track accuracy
2. Improve storm structure accuracy – wind field
3. Both



PACOM Goal: Increase US/Coalition Sea Maneuver Space

Combatant Commander Accuracy Requirements

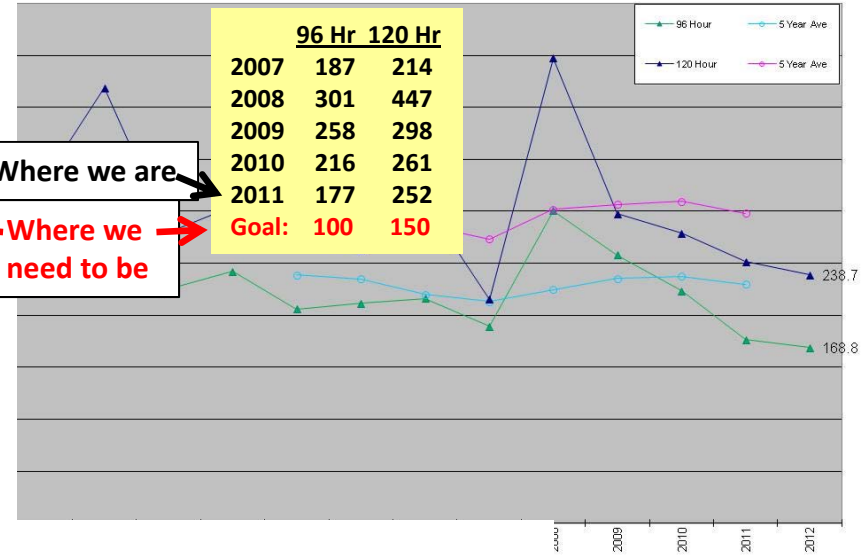
WPAC Track/Intensity Errors/Goals



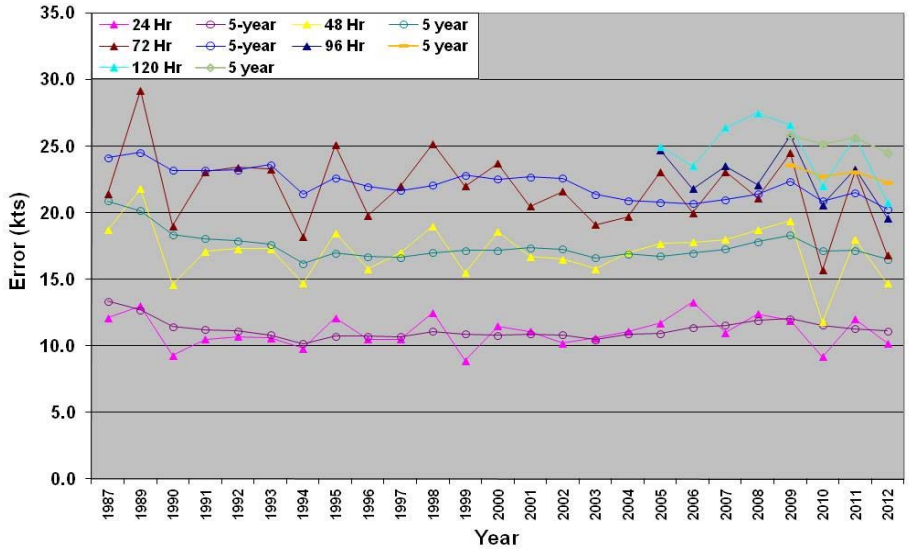
	24 Hr	48 Hr	72 Hr
2007	61	100	147
2008	66	120	198
2009	65	122	183
2010	60	99	152
2011	62	93	129
Goal:	25	50	75

Where we are

Where we need to be



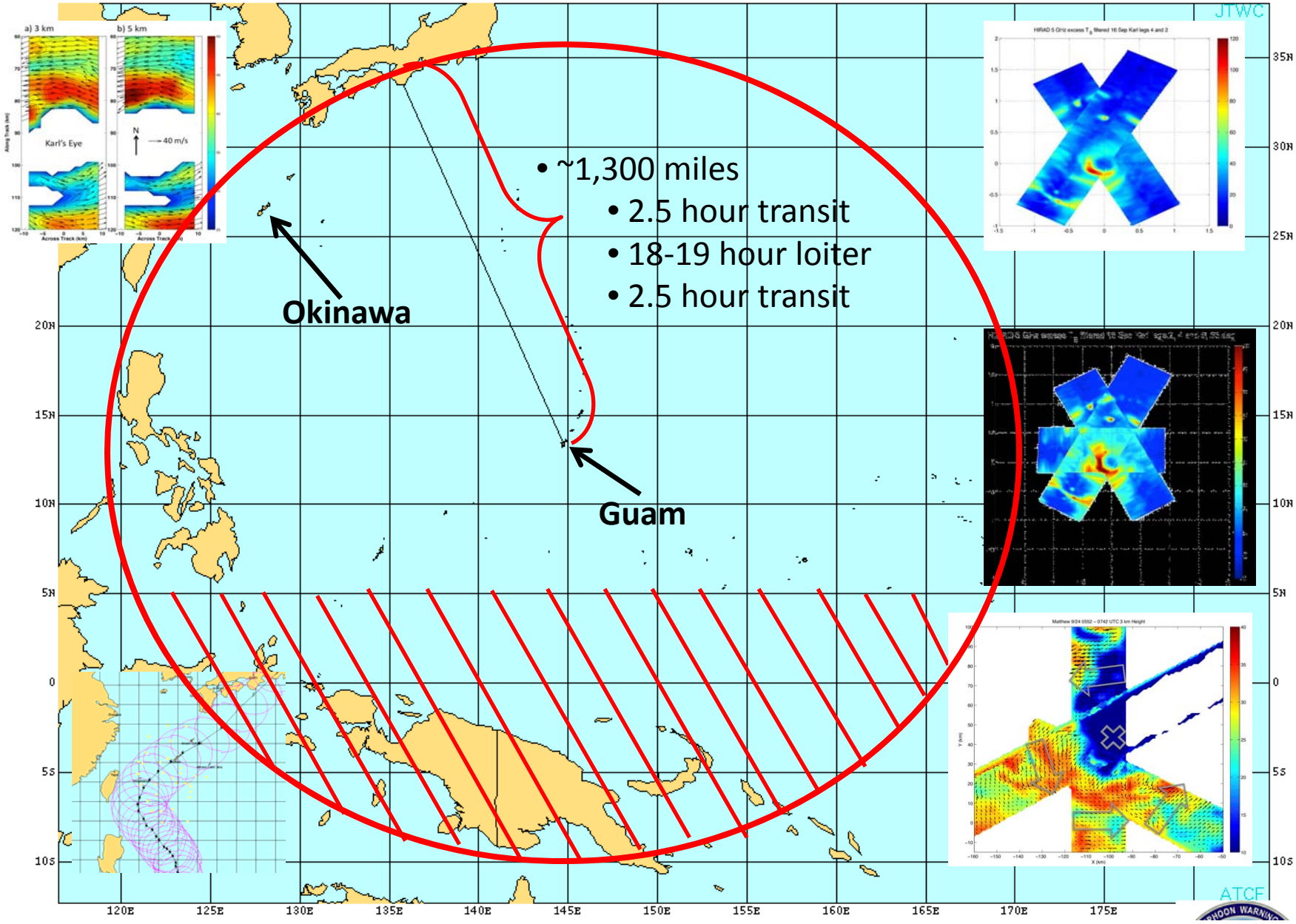
	96 Hr	120 Hr
2007	187	214
2008	301	447
2009	258	298
2010	216	261
2011	177	252
Goal:	100	150



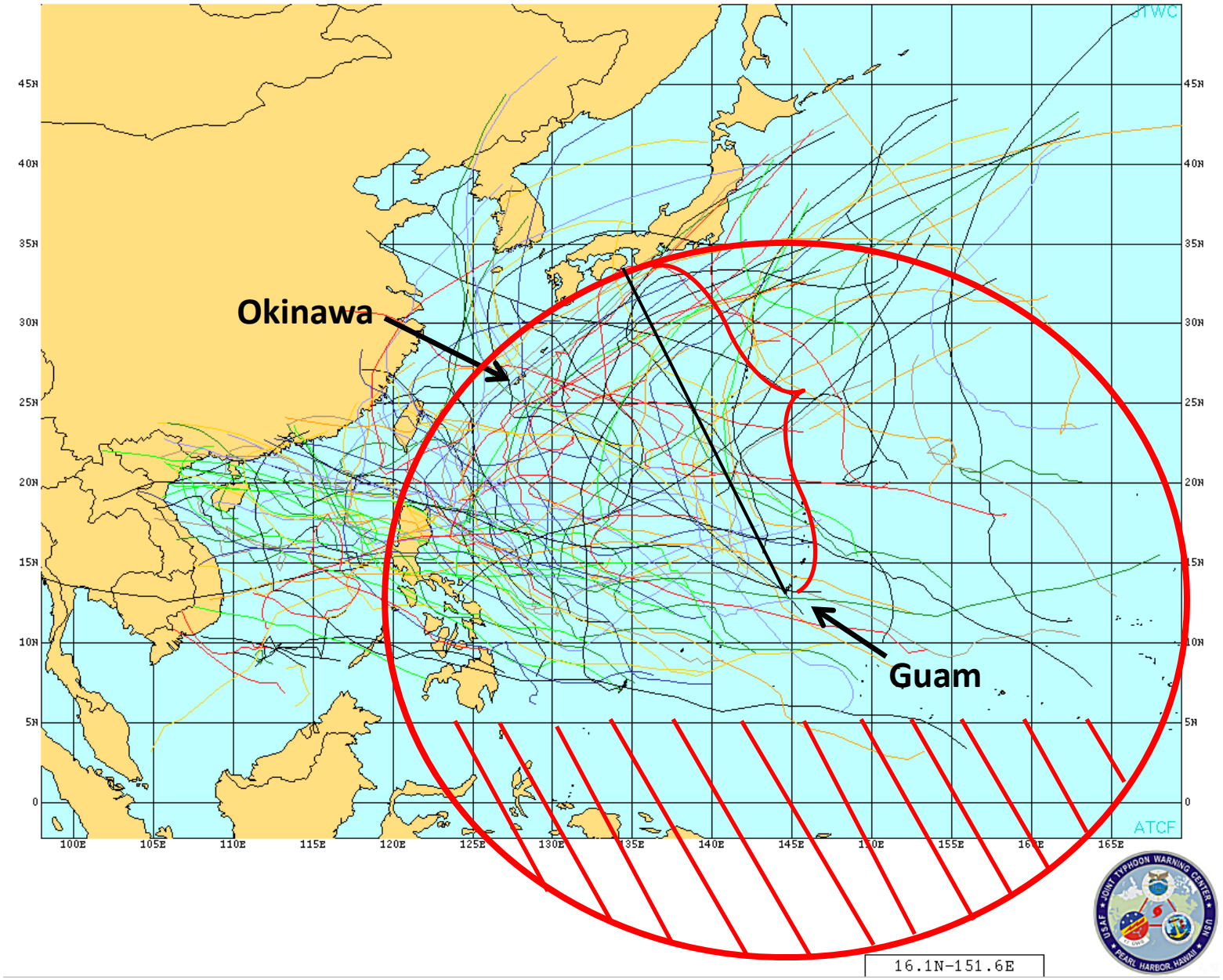
	24 Hr	48 Hr	72 Hr	96Hr	120Hr
2007	11	18	23	24	26
2008	12	19	21	22	28
2009	12	19	25	26	27
2010	9	12	15	21	24
2011	12	18	23	23	26
Goal:	Within 20% at all Forecast Times				

Must bring these numbers down!

Potential Sensing Strategy for WestPAC



???Questions???


JTWC
Okinawa
Guam
ATCF
45N
40N
35N
30N
25N
20N
15N
10N
5N
0
100E
105E
110E
115E
120E
125E
130E
135E
140E
145E
150E
155E
160E
165E
16.1N-151.6E